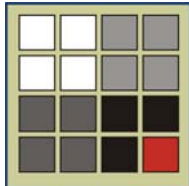


# **Social and Economic Assessment for Michigan's State Forests**

**Prepared for: Michigan Department of Natural Resources  
Forest, Mineral, and Fire Management Division**

**Lansing, Michigan**

**September 5, 2006**



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## Preface

Public Act 125 of 2004, Section 52505, requires the Michigan Department of Natural Resources (MiDNR) to seek and maintain third-party sustainable forestry certification. Forest certification requires that MiDNR forest management plans take into consideration social and economic parameters that affect future forest management operations. Currently, the MiDNR is preparing a statewide forest management plan, and each of three eco-teams are drafting ecoregional management plans. The social and economic information provided in this report will be used to assess current social and economic conditions and to develop future management directions within each of the plans.

The report focuses primarily on three ecoregions: the Western Upper Peninsula, Eastern Upper Peninsula, and Northern Lower Peninsula as defined by the MIDNR along county boundaries. It covers social and economic conditions within these ecoregions in aggregate and on a county-level basis. As a result data for the areas in and around Michigan state forests are highlighted.

The "Social and Economic Assessment for the Michigan National Forests" (July 25, 2003), by Larry Leefers, Karen Potter-Witter, and Maureen McDonough from Michigan State University, provides a general model for this report.

The assessment report is based on secondary data. No primary data collection was done. MiDNR personnel provided unpublished data from MiDNR records. The report presents analyses of existing data and discusses relationships and trends in the variables of interest, and contains some projections based on existing literature.

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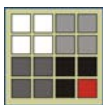
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## Chapter 7. Other Forest Uses and Values

### Introduction

Historically, social and economic assessments have had a strong emphasis on resources such as timber and outdoor recreation because structured information and data were available. There are many other forest uses and values that are important “products” of our state forests, even if they are not easily quantified. These other forest uses and values also influence planning and management of state forests. In many cases these values are reflected in areas that have special designations such as historic sites, natural areas, ecological reference sites, and so on. Today, the importance of these uses and values is more widely recognized under forest certification programs as well as by the MiDNR’s publics.

The MiDNR and USDA-Forest Service held a series of 53 focus group sessions beginning in 1996 to gather information on people’s views of Northern Lower Michigan and their visions and concerns regarding public land management ([www.michigan.gov/dnr/0,1607,7-153-10366\\_11865\\_28193-83078--,00.html](http://www.michigan.gov/dnr/0,1607,7-153-10366_11865_28193-83078--,00.html)). Participants identified a number of important characteristics that reflect the multitude of values and uses of the region

- Low population, less traffic, and absence of urban characteristics
- Slower, friendlier lifestyle
- Small town environment
- Beauty and solitude of lakes, rivers, and the natural environment
- Nearness to public lands
- Clean air, open spaces, the four seasons, and the pristine environment
- Hunting, fishing, viewing wildlife and other recreational activities
- Raw materials for manufacturing and good transportation networks

This chapter examines diverse uses and values by discussing cultural resources including historical, archaeological, sacred and special sites, benefits associated with gathering special forest products, and passive use values. This chapter draws on Leefers and others (2003) for its structure and part of its content. Other social and economic assessments (see for example, Arizona National Forests Socioeconomic Assessment Team 2005) rely mostly on agency records to identify designated areas and special places.

### Existing historic buildings and archaeological sites

The State Historic Preservation Office (SHPO) and the Office of the State Archaeologist (OSA) work to identify, record, investigate, interpret and protect historic and archaeological sites. In many cases, site location is sensitive information due to concerns related to private property and possible damage to sites.

There are a variety of historic sites and buildings and archaeological sites on Michigan’s state forests; some are open to visitors ([www.mcgi.state.mi.us/hso/](http://www.mcgi.state.mi.us/hso/)). Historic buildings include bridges, historic districts, lighthouses, fire lookout towers, charcoal kilns, cabins and lodges. For some sites, only small remnants of the buildings remain. Archaeological sites include historic sites containing artifacts from past human activities such as Civilian Conservation Corps camps, mining sites, town sites and logging camps as well as prehistoric or pre-European contact sites including resource processing sites and camps or villages (Table 7.1). Counties with the largest number of archaeological sites are located in the SLP, and the highest number is 1,286 sites in Saginaw County (Appendix Table A 7.1). The highest number of sites by ecoregion are: Delta County in the WUP (559 sites), Alger County in the EUP (482 sites), and Newaygo County in the NLP (340 sites).

**Table 7.1. Number of existing historic buildings and archaeological sites by ecoregion**

	WUP	EUP	NLP	Michigan
<b>Historic sites</b>				
State Register Listed Historic Sites				2,730
National Historic Landmarks				36
National Register Listed				1,514
<b>Archaeological sites</b>	2,561	1,609	3,655	19,510

Source: State Historic Preservation Office and the Office of the State Archaeologist.

### Native American cultural sites

Traditional cultural properties (TCPs) are places that are important to the beliefs, practices, history, and culture of living communities (Leefer et al. 2003). The National Historic Preservation Act (NHPA) requires consultation with Tribes and others to identify and manage traditional cultural properties. The act required that each state establish a SHPO and that the governor of each state appoint an officer to oversee the preservation activities. OSA deals with archaeological sites in Michigan under the NHPA. Examples of possible TCP's include places such as traditional vision quest sites, traditional gathering areas, and mourning and condolence sites. Currently, there is not a compiled list of TCPs associated with the state forests.

### Special sites

The concept of special places has existed in social science literature for decades; these are areas that have been given meaning by people who have an emotional attachment to them (Arizona National Forests Socioeconomic Assessment Team 2005). Special recreation sites are places that have special meaning for people because they have used them for traditional family and community activities. Many designated sites in northern Michigan are identified in Chapter 6, and for many people, these are special recreation sites. It is more difficult to identify the undesignated sites for which inventories have not been kept. Limited research provides examples of these types of sites (Schroeder 2002). People can identify the sites as well as the values they associate with them such as naturalness, beauty, remoteness, refuge and escape, social ties, family history, and heritage (Schroeder 2002). These values help explain why people are very attached to these places. Inadvertent alteration of these sites by land management agencies can create significant controversy and consequences.

Schroeder (2002) studied "special places" in the Upper Peninsula—his work offers some insight for the state forests in the UP (Table 7.2). First, he identified sites in the Upper Peninsula's Black River area. Then, he held a workshop with forest industry woodland managers. Their identification of these places ranged from the very broad (e.g. Menominee County) to the very specific (e.g. Gorge Falls). There was an emphasis on water features including rivers, lakes and waterfalls; these are traditional gathering places. No formal studies were found identifying locations of specific sites used for traditional family and community activities in the NLP. But there are many "known" special places used for hunting, fishing, gathering and dispersed recreation.

**Table 7.2. Special places near the Black River and in the Upper Peninsula (Schroeder 2002).**

<b>Black River</b>	<b>Upper Peninsula</b>
Area between harbor and campground	Bald Mountain
Black River between harbor and waterfalls (east side)	Copper Country
Black River Harbor Village	Delta County
Campground	Fence River
Conglomerate Falls	Hiawatha National Forest
Copper Peak	Huron Bay
Gorge Falls	Huron Mountain Club
Harbor/Breakwater/docks	Iron/Baraga County Line
Lakeshore/beach	Little Huron Mountains

<b>Black River</b>	<b>Upper Peninsula</b>
Lower reaches of Black River	Menominee County
Picnic area/park	Misery River
Potawatami Falls	Mosquito River
Rainbow Falls	Muskellunge State Park
Sandstone Falls	Pictured Rocks
The Narrows	Silver River
	Stonington Peninsula
	Tahquamenon Falls
	Van Riper Lake
	Whitefish River

Note: Adapted from Leefers and others (2003).

### **Benefits associated with gathering special forest products**

Forests play a significant role in providing non-timber forest products that enhance the livelihoods of many families (Emery 2001). From an assessment perspective, we recognize that government agencies and forest land owners do not monitor a myriad of forest-based products used for food, medicine, crafts, and cultural/ceremonial purposes. Wild berries, maple syrup, bark, roots, mushrooms and other materials are gathered for social and economic purposes. People gather and harvest these special forest products and use them for personal consumption, barter and gifts. They may also be an income source from sales of raw or processed materials. Subsistence and commercial use are economic dimensions associated with gathering (Jones and Lynch 2002). Collected materials can be used for household consumption and/or for trading, gift giving or sharing. Also, the materials may be sold or traded for other goods and services (Jones and Lynch 2002).

Gathering is used by families to bridge gaps in earnings and to supplement household income in times of economic need, such as seasonal unemployment. Gathering diversifies household economies in the UP, an area with a long history of “boom and bust” economic activity (Emery 1988). Other reasons for harvesting and gathering include:

- Recreational activities that provide pleasure or exercise (Jones and Lynch 2002)
- Social ties, including family outings, that develop between people due to gathering and harvesting activities (Stynes and Kakoyannis 1999, Emery 1988)
- Fulfilling or reinforcing values such as a strong work ethic, self-sufficiency and independence (Stynes and Kakoyannis 1999)
- Developing and enhancing a relationship with the natural environment (Stynes and Kakoyannis 1999, Emery 1988, Lynch 2002).

### **Passive use values**

Use values such as forest products, recreation, and water are of interest to many people. But non-use or passive values are also central to people’s relationship to forests. Economists classify these non-use values as existence values, option values and bequest values (Freeman 1993). Existence value is simply the value people place on a resource or location for simply existing—use is not a concern. For example, people may place value on the mere existence of Isle Royale, even though they have no intention of ever seeing it. Option value is the value associated with maintaining future resource options. So people may not be ready to hike on state forest trails at this time, but they value the trails thinking that they may someday choose to use them. Finally, bequest value is the value people place on the knowledge that a resource will be available for future generations; we want our children and grandchildren to be able to fish on the AuSable River at some point in the future. Hence, people value a resource because it is or will be there (Freeman 1993).

Americans love forests. They have valued nature in their lives as evidenced by law, literature and art. For example, “wilderness” is highly valued by Americans (Wellman and Propst 2003). For over 100 years, conflicts between use values and nonuse values relative to forest resources have circulated around views of nature on the North American continent as a “terrible” versus nature as a source of wealth and economic opportunity. Loomis and Richardson (2001) estimated that existence and bequest values held by U.S. citizens in the lower 48 states totaled \$306 million; eastern wilderness values were estimated to be \$19 million.

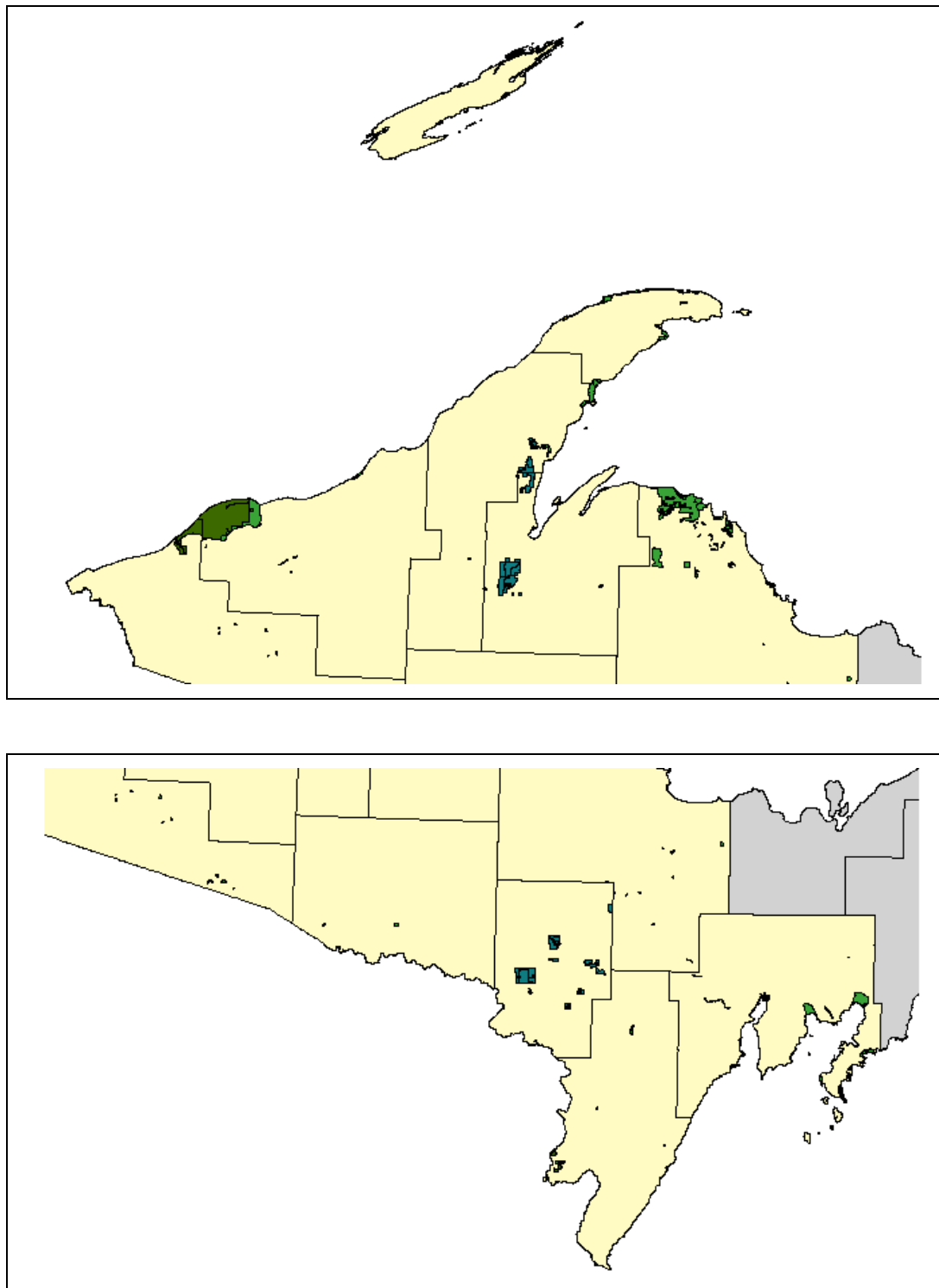
Over 75% of Americans considered themselves to be environmentalists and support values and behavior associated with this view (Dunlap and Scarce 1991). While this does not necessarily transfer into environmental behavior, it is an indicator of the importance Americans place on nature. Many environmental beliefs and values are widely shared among Americans, and most of the values that characterize American environmentalism are nonutilitarian (i.e., non-use).

Land and resource allocations reflect many of the values held by Michigan’s people. Examples of areas of interest to citizens are: natural areas, wildlife areas, the Sand Lake Quiet, Kirtland warbler habitat areas, natural rivers, ecological reference areas, critical dunes, and coastal environmental areas (Figures 7.1 – 7.3). Economists may be able to estimate non-use values for these areas, but the American political process has already placed a value on them by designating and protecting them.

**Legend for Figures 7.1 to 7.3 showing biological diversity areas.**

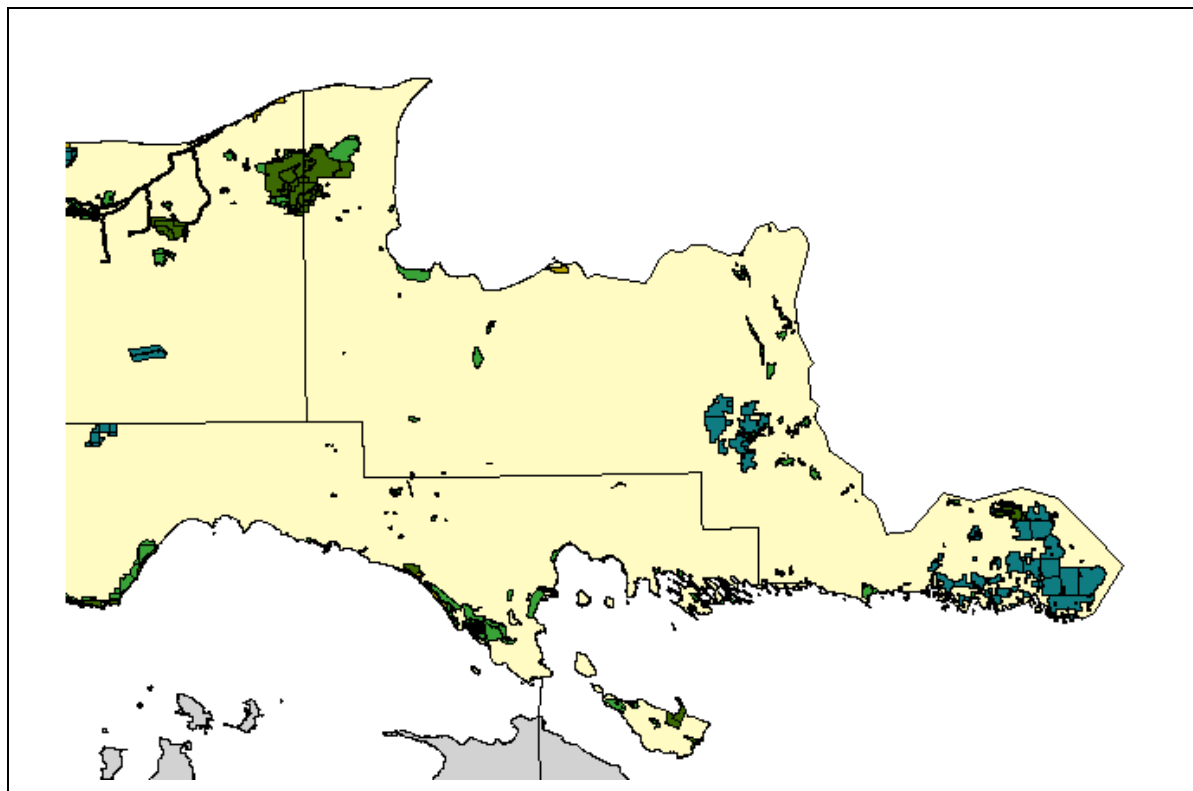
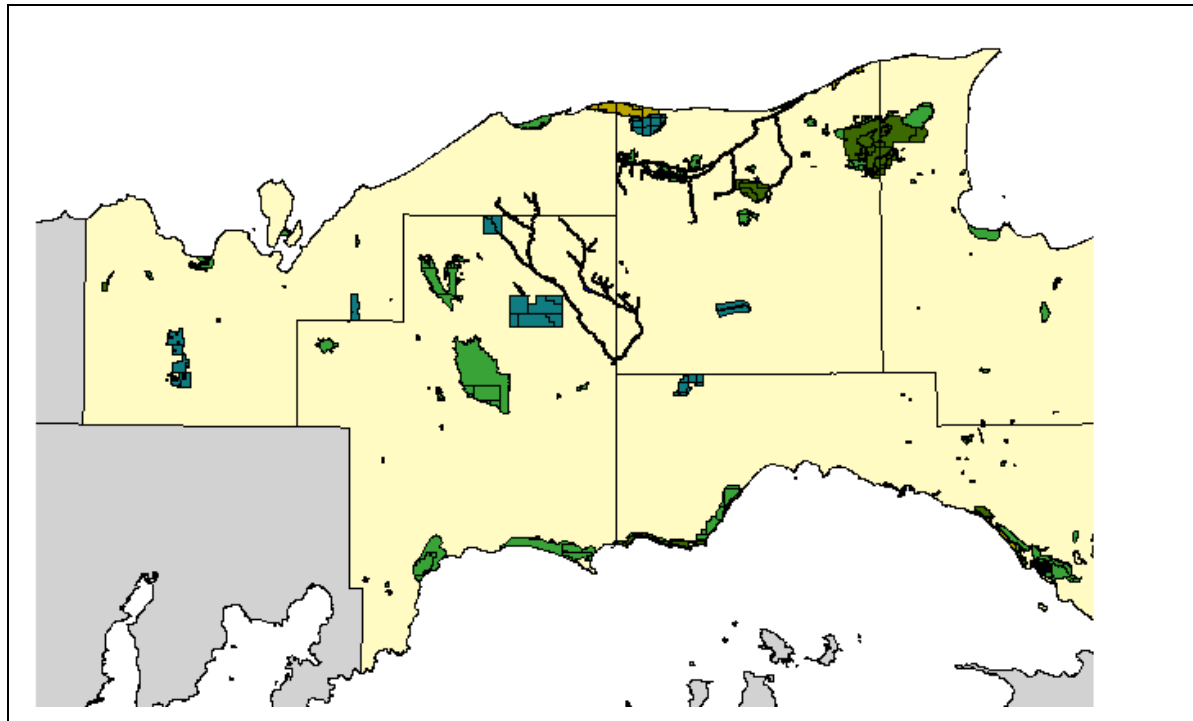
	<b>Natural areas</b>
	<b>Wildlife areas</b>
	<b>Sand Lakes Quiet Area</b>
	<b>Natural Rivers Zoning District</b>
	<b>Natural Rivers Vegetative Boundary</b>
	<b>Kirkland warbler habitat</b>
	<b>Ecological reference areas</b>
	<b>Critical dunes</b>
	<b>Coastal environmental areas</b>

(note that maps are shown as panels to increase resolution in this report)

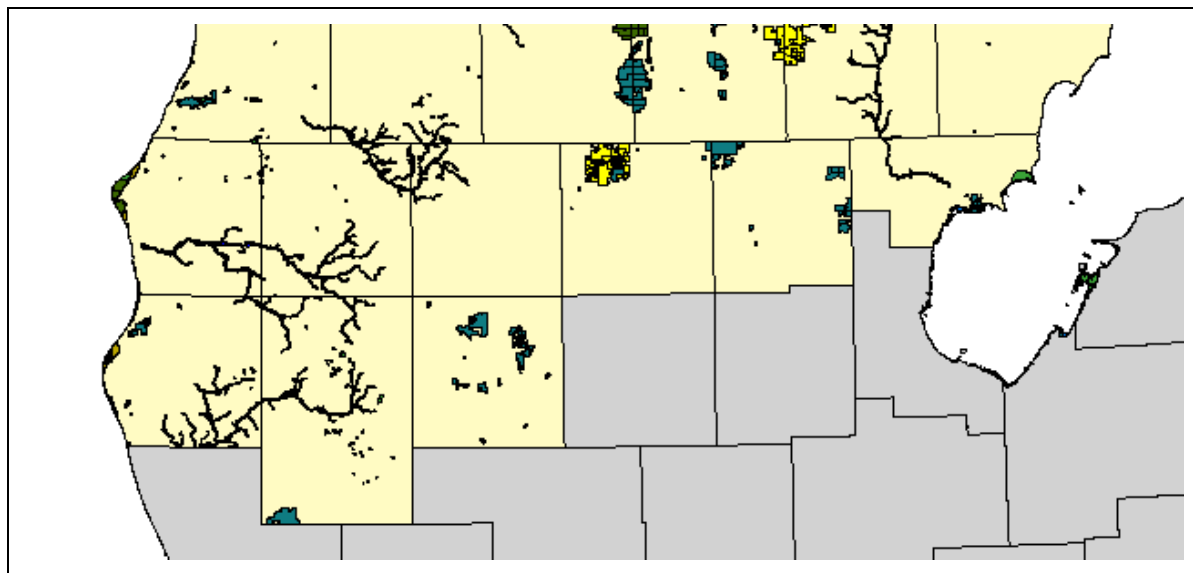
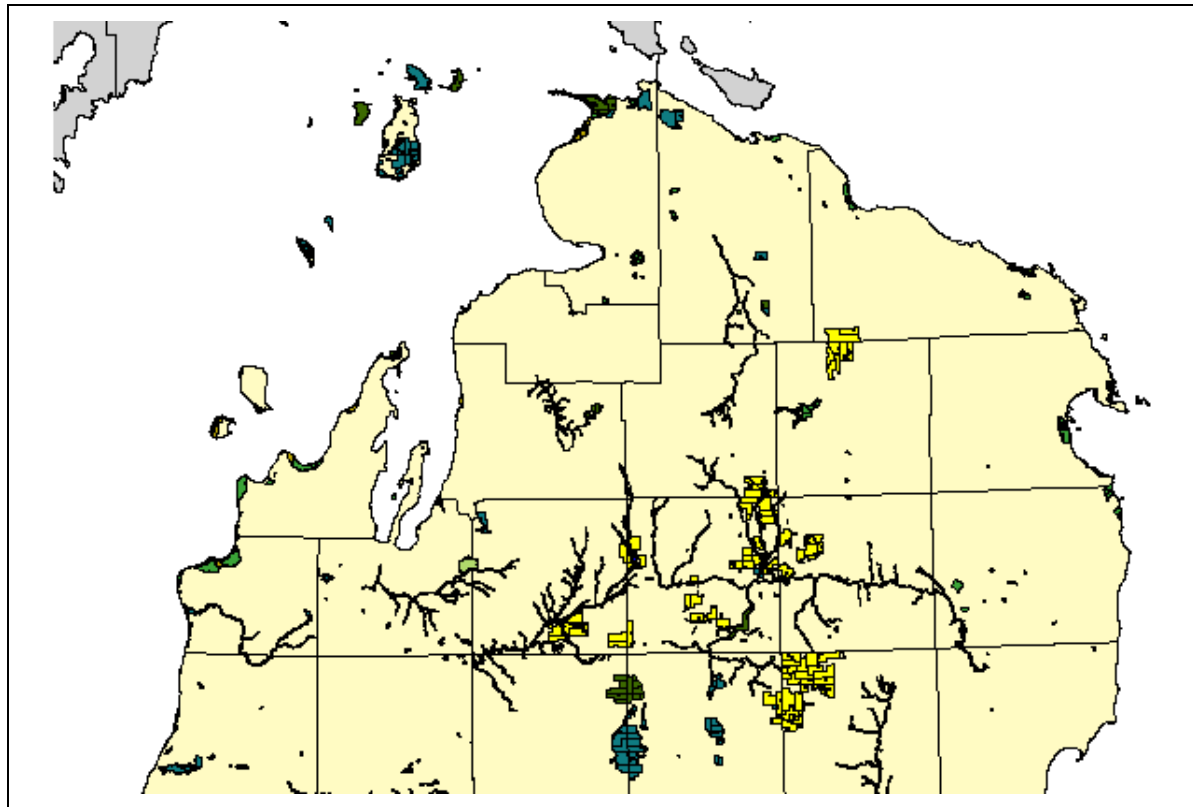


**Figure 7.1. Biological diversity areas in the Western Upper Peninsula**





**Figure 7.2. Biological diversity areas in the Eastern Upper Peninsula**



**Figure 7.3. Biological diversity areas in the Northern Lower Peninsula**

## References

- Arizona National Forests Socioeconomic Assessment Team. 2005. Socio-economic assessment for the Coconino National Forest. Phoenix: The University of Arizona, School of Natural Resources. 140 p.
- Dunlap, R.E., and R. Scarce. 1991. The polls-poll trends: environmental problems and protection. *Public Opinion Quarterly*. 55: 713-734.
- Emery, M.R. 2001. Non-Timber Forest Products and Livelihoods in Michigan's Upper Peninsula. In *Forest Communities in the Third Millennium: Linking Research, Business and Policy towards a Sustainable Non-Timber Forest Product Sector*, edited by J. Zasada. GTR-NC-217. St. Paul, MN:USDA Forest Service, North Central Research Station.
- Emery, M.R. 1998. Invisible livelihoods: nontimber forest products in Michigan's upper peninsula. New Brunswick, NJ: Rutgers University. Doctoral dissertation.
- Freeman, A.M. 1993. The measurement of environmental and resource values. Washington, DC: Resources for the Future. 516 p.
- Jones, E., and K. Lynch. 2002. The relevance of sociocultural variables to nontimber forest product research, policy and management. In: Jones, E.T.; McClain, R.J.; Weigland, J. eds. *Nontimber forest products in the U.S.* Lawrence, KS: University Press of Kansas: 26-51
- Leefers, L., K. Potter-Witter, and M. McDonough. 2003. Social and economic assessment for the Michigan national forests. 244 p. Report submitted to Robert Brenner, James DiMaio, David Maercklein, and Fred P. Clark on July 25, 2003.
- Loomis, J.B., and R. Richardson. 2001. Economic values of the U.S. wilderness system. *International Journal of Wilderness*. 7(1): 31-34.
- Schroeder, H.. 2002. Experiencing nature in special places: surveys in the North-Central region. *Journal of Forestry*. 100 (5): 10-14.
- Stynes, D., and C. Kakoyannis. 1999. Outdoor activities. In: McDonough, Maureen H. ed.. *The role of natural resources in community and regional economic stability in the eastern Upper Peninsula*. East Lansing, MI: Michigan Agricultural Experiment Station Research Report 568:53.66.
- Wellman, D., and D. Propst. 2004. *Wildland Recreation Policy*, 2nd Edition. Malabar, FL: Krieger.

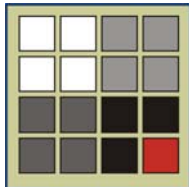
# **Social and Economic Assessment for Michigan's State Forests**

## **APPENDIX**

**Prepared for: Michigan Department of Natural Resources  
Forest, Mineral, and Fire Management Division**

**Lansing, Michigan**

**September 5, 2006**



**Prepared by:  
Tessa Systems, LLC  
East Lansing, MI**

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